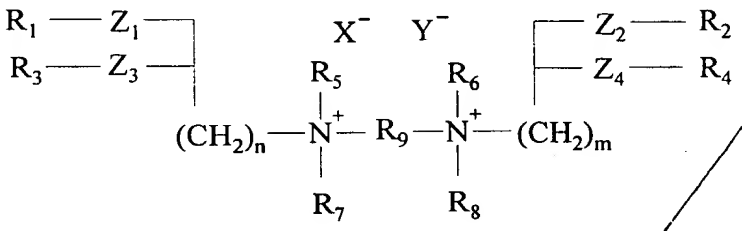
add a'7

WHAT IS CLAIMED IS:

1. A composition comprising a cationic lipid compound having the structure



wherein Z_1, Z_2, Z_3 and Z_4 are the same or different and are -O-C(O)- or -O-;

R_1 and R_2 are the same or different and are H, C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;

R_3 and R_4 are the same or different and are C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;

R_5, R_6, R_7 and R_8 are the same or different and are H, C_1 to C_{10} alkyl or C_1 to C_{10} alkenyl;

R_9 is a linker;

n and m are the same or different and are 1 to 8; and

X and Y are the same or different and are non-toxic anions.

2. The composition of claim 1, wherein R_9 is optionally substituted C_1 to C_{10} alkyl or optionally substituted C_1 to C_{10} alkenyl.

3. The composition of claim 2, wherein the linker comprises a peptide linkage.

4. The composition of claim 3, wherein the cationic lipid compound is HB-DMRIE-Ox-Trp-γ-DMRIE.

5. The composition according to claim 1, wherein R_9 comprises an optionally substituted polyalkyloxy group.

6. The composition according to claim 5, wherein the polyalkyloxy group contains from 1 to about 500 alkyloxy mers.

7. The composition according to claim 6, wherein the polyalkyloxy group contains from 1 to about 100 alkyloxy mers.

8. The composition according to claim 7, wherein the cationic lipid compound is PentaEG-bis-DMRIE.

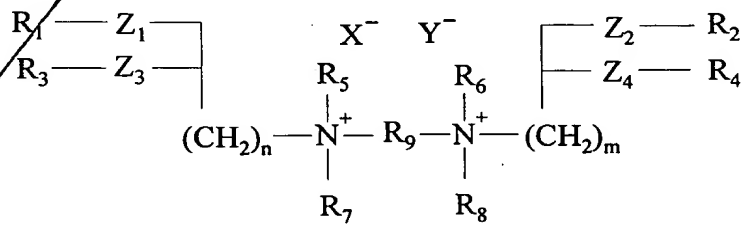
9. The composition according to claim 7, wherein R_9 comprises a peptide linkage.

10. The composition according to claim 9, wherein the cationic lipid compound is PEG34-bis-But-DMRIE-propylamide.

11. The composition of claim 2, wherein the linker comprises a ureyl or bis-ureyl linkage.

12. The composition of claim 1 further comprising one or more co-lipids.

13. A composition comprising a cationic lipid compound having the structure



wherein Z_1, Z_2, Z_3 and Z_4 are the same or different and are -O-C(O)- or -O-;
R_1 and R_2 are the same or different and are H, C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;
R_3 and R_4 are the same or different and are C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;

R_5, R_6, R_7 and R_8 are the same or different and are H, C_1 to C_{10} alkyl or C_1 to C_{10} alkenyl;

R_9 is a linker having DNA and/or receptor binding affinity;

n and m are the same or different and are 1 to 8; and

X and Y are the same or different and are non-toxic anions.

14. The composition of claim 13, wherein R_9 is an amino acid, saccharide, peptide, polysaccharide, polypeptide, protein, polyamine, or peptidomimetic moiety.

15. The composition of claim 14, wherein R_9 is a protein.

16. The composition of claim 15, wherein said protein is a transferrin.

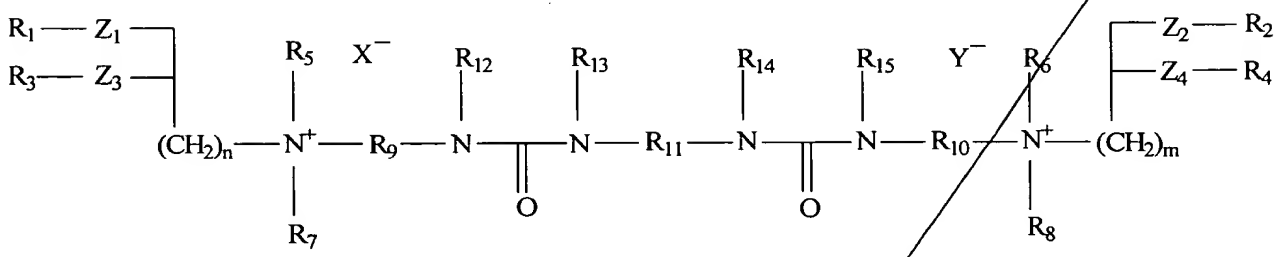
17. The composition of claim 15, wherein said protein is an immunoglobulin.

18. The composition of claim 15, wherein said protein is a histone.

19. The composition of claim 14, wherein R_9 is spermine or spermidine, or a derivative thereof.

20. The composition of claim 13 further comprising one or more co-lipids.

21. A composition comprising a cationic lipid compound having the



structure

wherein Z_1, Z_2, Z_3 and Z_4 are the same or different and are -O-C(O)- or -O-;

R_1 and R_2 are the same or different and are H, C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;

R_3 and R_4 are the same or different and are C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;

R_5, R_6, R_7, R_8, R_{12}, R_{13}, R_{14}, and R_{15} are the same or different and are H, C_1 to C_{10} alkyl or C_1 to C_{10} alkenyl;

R_9 and R_{10} are the same or different and are optionally substituted C_1 to C_{10} alkyl or optionally substituted C_1 to C_{10} alkenyl;

R_{11} is C_1 to C_{10} alkyl or C_1 to C_{10} alkenyl, each optionally substituted;

n and m are the same or different and are 1 to 8; and

X and Y are the same or different and are non-toxic anions.

22. The composition of claim 21, wherein the cationic lipid compound is selected from the group consisting of SBDU-DMRIE, SBGU-DMRIE and SHGU-DMRIE.

23. The composition of claim 21 further comprising one or more co-lipids.

24. An immunogenic composition comprising an immunogen and the composition of claim 1.

25. The immunogenic composition of claim 24 wherein the immunogen is provided by an immunogen-encoding nucleotide sequence.

26. The immunogenic composition of claim 25 wherein the immunogen-encoding nucleotide sequence is plasmid DNA, or a portion thereof.

27. The immunogenic composition of claim 24 further comprising one or more co-lipids.

28. A method for inducing an immune response in a vertebrate, the method comprising administering to the vertebrate an immunogenic composition comprising one or more immunogen-encoding nucleotide sequences and the composition of claim 1, in an amount sufficient to generate an immune response to the encoded immunogen.

29. The method of claim 28 wherein the vertebrate is a mammal.

30. The method of claim 29 wherein the mammal is a human.

31. A method for delivering a biologically active agent to a cell of a plant or animal, the method comprising:

preparing a lipid aggregate comprising the biologically active agent and the composition of claim 1; and

contacting the cell with the lipid aggregate.

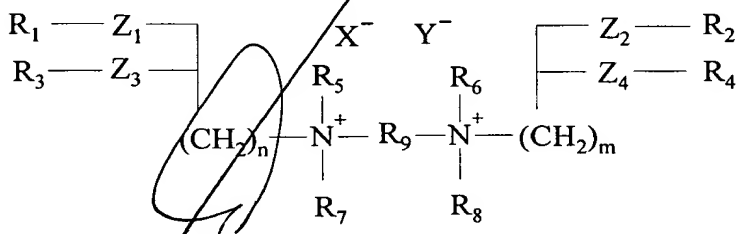
32. A pharmaceutical kit for use in delivering a polynucleotide to a vertebrate, said kit comprising a cationic lipid compound, optionally a co-lipid, optionally a polynucleotide, and optionally means for administering to a vertebrate said cationic lipid compound, polynucleotide, and co-lipid.

33. The pharmaceutical kit according to claim 32, wherein the polynucleotide encodes a polypeptide within vertebrate cells *in vivo*.

34. The pharmaceutical kit according to claim 33, wherein the kit contains 1 ng to about 30 mg of the polynucleotide.

35. The pharmaceutical kit according to claim 34, wherein the kit contains 100 ng to about 10 mg of the polynucleotide.

36. The pharmaceutical kit according to claim 32, wherein the cationic lipid compound has the structure



wherein Z_1, Z_2, Z_3 and Z_4 are the same or different and are -O-C(O)- or -O-;
R_1 and R_2 are the same or different and are H, C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;
R_3 and R_4 are the same or different and are C_1 to C_{24} alkyl or C_1 to C_{24} alkenyl;
R_5, R_6, R_7 and R_8 are the same or different and are H, C_1 to C_{10} alkyl or C_1 to C_{10} alkenyl;
R_9 is a linker;
n and m are the same or different and are 1 to 8; and
X and Y are the same or different and are non-toxic anions.

37. The pharmaceutical kit according to claim 36, wherein R_9 comprises an optionally substituted polyalkyloxy group.

38. The pharmaceutical kit according to claim 37, wherein the polyalkyloxy group contains from 1 to about 500 alkyloxy mers.

39. The pharmaceutical kit according to claim 38, wherein the polyalkyloxy group contains from 1 to about 100 alkyloxy mers.

40. The pharmaceutical kit according to claim 39, wherein the cationic lipid compound is PentaEG-bis-DMRIE.

41. The pharmaceutical kit according to claim 39, wherein R_9 comprises a peptide linkage.

42. The pharmaceutical kit according to claim 41, wherein the cationic lipid compound is PEG34-bis-But-DMRIE-propylamide.

43. The pharmaceutical kit according to claim 36, wherein the linker comprises a peptide linkage.

44. The pharmaceutical kit according to claim 43, wherein the cationic lipid compound is HB-DMRIE-Ox-Trp-γ-DMRIE.

45. The pharmaceutical kit according to claim 36, wherein the linker comprises a bis-ureyl linkage.

46. The pharmaceutical kit according to claim 45, wherein the cationic lipid compound is SBDU-DMRIE, SBGU-DMRIE or SHGU-DMRIE.

add C(e)